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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/581,878 | 09/11/2000 | Tadahiro Ohmi | FUK-71 | 7595 |

22855 7590 02/07/2005

RANDALL J. KNUTH P.C.
4921 DESOTO DRIVE
FORT WAYNE, IN 46815

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| EXAMINER |
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ALEJANDRO MULERO, LUZ L

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| ART UNIT | PAPER NUMBER |
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1763

DATE MAILED: 02/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/581,878

Applicant(s)

OHMI ET AL.

Examiner

Luz L. Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12 and 13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
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| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claims 12 and 13 are objected to because of the following informalities: at line 3, it seems that "defining" should read – defines – for proper grammar. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4, 6-10, and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al., U.S. Patent 5,580,420 in view of Takahashi, U.S. Patent 5,314,574.

Watanabe et al. shows the invention substantially as claimed including a semiconductor manufacturing apparatus for processing a substrate surface (see col. 1, lines 6-14), the apparatus comprising: a vacuum vessel 6 having a top plate 3, 66; a bottom plate 31 in which a substrate stage is provided (see figs. 1 and 4); two cylinders 15 installed surrounding the substrate stage (see col. 10, lines 28-35, and figs. 1 and 4); a gap between the cylinders and the top vacuum vessel plate is made variable by lifting/lowering the cylinder (see col. 7, lines 20-22); the cylinders having a lifting/lowering mechanism 36 (see col. 10, lines 28-35, and figs. 1 and 4) in order to separate a space which the cylinder surrounds comprising a processing chamber 6 from the space outside the cylinder including a transport chamber 32 for transferring the substrate and provided with a substrate conveyer mechanism 10, 101 for transferring the substrate between the processing chamber and the transport chamber through the gap (see col. 6-line 63 to col. 7-line 25); the processing chamber is provided with a processing chamber gas inlet and a gas outlet (see col. 9, lines 55-62).

Watanabe et al. does not expressly disclose that the transport chamber is provided with a gas inlet and a gas outlet, that the cylinders are provided with an O-ring, and that the cylinders are connected to the bottom plate through bellows. Takahashi discloses an apparatus in which the transfer chamber comprises a gas inlet for supplying nitrogen gas and a gas outlet connected to an exhaust system in order to set

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a vacuum atmosphere (see col. 5, lines 24-36 and fig. 8). Therefore, in view of this disclosure it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Watanabe et al. as to further comprise a gas inlet and a gas outlet in the transfer chamber in order to set a vacuum atmosphere.

Furthermore, Takahashi discloses the use of O-rings 21 for tightly seal the chamber and the use of bellows 22 connected to the bottom plate 23 for freely expansion and compression of the cylinders lifting/lowering mechanism (see col. 4, lines 27-53). Therefore, in view of these disclosures it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus disclosed by Watanabe et al. as to further comprise the claimed O-ring and bellows in order to optimize the apparatus by tightly sealing the chamber and by freely expanding and compressing the lifting/lowering mechanism.

With respect to the substrate stage having an operatively immovable substrate receiving portion, it should be noted that such limitation is directed to a method limitation instead of an apparatus limitation, and since an apparatus is being claimed as the instant invention, the method teaching are not considered to be the matter at hand since a variety of methods can be performed in the apparatus. The apparatus of Watanabe modified by Takahashi et al. is capable of having an operatively immovable substrate receiving portion during processing. Furthermore, regarding claims 12 and 13, note that the upper end of the substrate stage(s) is capable of being the immovable substrate receiving portion.

With respect to claims 3 and 8, note that the apparatus of Watanabe et al. shows a vacuum vessel 1 which has a modular configuration, the modular configuration including a first modular unit having said processing chamber 6 and a second modular unit having a substrate transport mechanism 32 (see figs. 1 and 4). Furthermore, with respect to claims 4, 6-7 and 9-10, the Watanabe et al. reference further discloses that the apparatus comprises a microwave plasma generation mechanism for generating plasma in the processing chamber, magnetic field generating means 651-653 disposed substantially on the circumference surrounding the chamber in the atmosphere outside of the vacuum vessel, and radio frequency power source 610 provided to the substrate stage (see the abstract, col. 1-line 65 to col. 2-line 10, col. 9, line 24-62, and figs. 1 and 4).

Watanabe et al. does not expressly disclose that the magnetic field generating means are permanent magnets but it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Watanabe et al. as to comprise permanent magnets as the magnetic field generation means because permanent magnets are known in the art to be suitable means for generating a magnetic field and therefore their use in the apparatus of Watanabe et al. would be prima facie obvious in absence of evidence of unexpected results.

Claim 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al., U.S. Patent 5,580,420 in view of Takahashi, U.S. Patent 5,314,574. as

applied to claims 1-4, 6-10, and 12-13 above, and further in view of Masahiro et al., JP 10-177994.

Watanabe et al. and Takahashi do not expressly disclose that the plasma generation mechanism radiates microwave through a slot antenna. Masahiro et al. discloses a plasma treating device utilizing a microwave plasma generating device comprising a slot antenna 202 to perform uniform plasma treatment (see abstract). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Watanabe et al. as to comprise a microwave plasma generation mechanism which comprises a slot antenna in order to optimize the apparatus by performing uniform plasma treatments with high reproducibility since the microwave can be radiated stably.

Response to Arguments

Applicant's arguments filed 11/15/04 have been fully considered but are not deemed persuasive. Applicant argues that the newly added claim limitation "said substrate stage having an operatively immovable substrate receiving portion" distinguishes over the references of record. However, it should be noted that such limitation is directed to a method limitation instead of an apparatus limitation, and since an apparatus is being claimed as the instant invention, the method teaching are not considered to be the matter at hand since a variety of methods can be performed in the apparatus. The apparatus of Watanabe modified by Takahashi et al. is capable of having an operatively immovable substrate receiving portion during processing.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 571-272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Luz L. Alejandro
Primary Examiner
Art Unit 1763

February 3, 2005